Bilateral orbital cellulitis due to hematogenous spread from a rare site- A case report

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Abstract
A 67 years old diabetic male patient suffering from cellulitis of the right lower extremity presented with painful severe loss of vision, proptosis and periorbital swelling in both eyes. Magnetic Resonance Imaging (MRI) of brain and orbits showed orbital soft tissue swelling with thickened extraocular muscles in both eyes. Patient with this sequence of presentation was diagnosed as bilateral orbital cellulitis. He was treated with intravenous antibiotics following which his vision recovered in both eyes and other signs of orbital cellulitis also resolved.

Keywords: Cellulitis, Orbital cellulitis, Proptosis.

Introduction
Orbital cellulitis involves inflammation of the orbit posterior to the orbital septum. The common causes for orbital cellulitis are rhinosinusitis, trauma, dental infection, and ocular surgeries. Infective endocarditis and cellulitis are very rare causes reported in literature and the infection spreads through the bloodstream to affect the peripheral organs.[1,2] (Needs rephrasing) Asif et al[3] reported a case of bilateral orbital cellulitis due to infective endocarditis where the infection occurred in the cardiac valves and the septic emboli spread through blood stream to affect the ocular structures. Specticemia and cellulitis of the distant organ causing orbital cellulitis due to hematogenous etiology has rarely been reported. The disease manifesting as bilateral condition is also rare in literature. Here, we report a rare case of bilateral orbital cellulitis due to hematogenous etiology from cellulitis of lower extremity.

Case Report
A 67 years old male patient presented to emergency department with painful severe loss of vision, proptosis and periorbital swelling in both eyes for past one day. He was also suffering from fever for the last four days and had a progressive ulcer and cellulitis over his right foot for the same duration. Patient was a known case of uncontrolled Type 2 diabetes mellitus on oral hypoglycemic medications. Visual acuity of both eyes was counting finger half meter by Snellen's Chart and near vision was N36. On examination of both eyes, anterior segment showed severely chemosed and congested conjunctiva. (Fig. 1) Cornea was clear, anterior chamber depth was normal and pupil were 3mm round, regular and reacting to light. Fundoscopic examination showed normal optic disc, blood vessels and macula. Ocular motility was grossly limited in all gazes in both the eyes. There was no neurological deficit along the distribution of 5th cranial nerve. Blood investigations showed raised total leucocyte count. MRI of brain was normal with no features of cavernous sinus thrombosis however MRI orbit revealed orbital soft tissue swelling and prominently thickened extraocular muscles. (Fig. 2)

Fig. 1: Marked conjunctival chemosis in both eyes

Fig. 2: Axial section of MRI brain and orbits showing thickened extraocular muscles

Patient was started on intravenous ceftriaxone, injection vancomycin and infusion metronidazole. He was also advised topical moxifloxacin eye drop and artificial tear substitutes in both eyes. At two weeks follow up, the patient's best corrected visual acuity was 6/12, conjunctival chemosis was resolving and extraocular motility was full, free and painless in both the eyes. (Fig. 3)

Fig. 3: Shows improvement in extraocular motility in both eyes

Table 1: Chandler's classification of orbital cellulitis

Stage	Characteristics
1	Preseptal cellulitis-characterized by swollen lids with edema of the orbital content from reduced drainage into the ethmoidal vessels
2	Orbital cellulitis-characterized by diffuse infiltration of inflammatory cells into the orbital tissue with conjunctival chemosis, mild proptosis, lid swellings and some degree of visual impairment
3	Subperiosteal abscess-characterized by collection of inflammatory materials under the space between the bones and the periorbita with proptosis, lid edema, chemosis, tenderness over the abscess site, limitation of ocular motility and reduced vision
4	Intraorbital abscess-characterized by infiltration of the intraorbital soft tissues by purulent materials with more severe pain, fever, lid swelling and varying degrees of severe visual loss
5	Cavernous sinus thrombosis-characterized by more proptosis, extra-ocular motility loss in both eyes with severe loss of vision, lid swellings in both eyes and neurological deficit involving the 3th, 5th, 6th cranial nerve and optic neuritis. They have nausea and vomiting with fevers.

Discussion

Orbital cellulitis is an ocular emergency. Cases of orbital cellulitis are commonly seen in our day to day practice but incidence of bilateral orbital cellulitis is less. Orbital cellulitis is mostly caused due to direct spread of infection from paranasal sinuses, face, globe and dental sepsis. It can also occur following trauma or surgery in the eye and very rarely by hematogenous spread from distant sites due to bacteremia. According to earlier publications, trauma is the most common cause for pre-septal cellulitis and sinusitis the most common cause for orbital cellulitis in adults[1]. Raja NS et al[2] have reported a case of bilateral orbital cellulitis due to Neisseria gonorrhoeae which was acquired by sexual contact (distant site).

In the pre-antibiotic era, many cases of total blindness due to orbital cellulitis have been reported but with the advent of intravenous antibiotics, permanent loss of vision is unusual.[4,5] The mechanisms for visual loss in orbital inflammatory conditions are: (1) optic neuritis as a reaction to adjacent or nearby infection; (2) ischemia resulting from thrombophlebitis along the valveless orbital veins and (3) compressive/pressure effect possibly resulting in central artery occlusion.

There are five groups of orbital cellulitis in Chandler's classification[6] (Table1). According to this classification, our patient belongs into the group 5 but without cavernous sinus thrombosis, neurological deficits and optic neuritis. Hence, we categorize our patient as bilateral orbital cellulitis. As, he had an ulcer over his right lower extremity which could have acted as a source of infection, we presume it to be a case of bilateral orbital cellulitis secondary to hematogenous spread.

Bilateral orbital cellulitis should be taken more seriously since it can be associated with complications like cavernous sinus thrombosis and meningitis. It should be managed aggressively both medically and surgically if needed. Radiographic imaging is an important diagnostic tool where Computed Tomography (CT scan) provides information regarding the paranasal sinuses, extent of involvement of the

orbit, orbital and subperiosteal abscess and intracranial involvement. But, MRI is superior to CT scan to reveal the intracranial complications like cavernous sinus thrombosis.[7]

It is a known fact that the most common organisms involved in this disease are S. Pneumoniae, S.aureus, H. influenza, other streptococci and non-spore forming organisms.[8,9] So, the most commonly used antibiotics are broad spectrum antibiotics like cephalosporines. Metronidazole is used for anaerobic organisms. The antibiotics are initially given for three consecutive days and the response is assessed. If the response is good, the antibiotic is continued for the next 2-3 weeks.[10] Urgent drainage (within 24 hours of presentation) is advised for very large abscesses, for extensive superior or inferior orbital abscesses, and for patients with intracranial complications.[11]

In our case, the cause was hematogenous spread of infection, with good response to prompt intravenous antibiotic and regular dressing of the lower limb ulcer. This aggressive medical treatment leads to good visual recovery in both the eyes.

Hence, to conclude, cellulitis in any part of the body can give rise to orbital cellulitis which can present as a bilateral disease. Prompt management with intravenous antibiotics can lead to dramatic improvement in the vision.

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